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APPLICATION

Of

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For

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On

A PROCESS FOR IMPROVING PRINT QUALITY OF A DOCUMENT CREATED UTILIZING INTERNET-TYPE NETWORK APPLICATIONS

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A PROCESS FOR IMPROVING PRINT QUALITY OF A DOCUMENT CREATED UTILIZING INTERNET-TYPE NETWORK APPLICATIONS

RELATED APPLICATION

This application claims priority from provisional application Serial No. 60/130,928, filed April 24, 1999.

BACKGROUND OF THE INVENTION

This invention relates to computerized printing processes. More particularly, the present invention relates to a process for enabling end-users in a computer network, such as the Internet, to create and print high-resolution documents from their desktop printers.

There are several options currently available to the average consumer seeking printed materials. One option is to purchase the printed materials directly from a provider. However, this option is usually quite expensive and limited to the selection provided. Another option involves utilizing a commercial printer. Artwork and document preparation must typically be done by a graphic artist before submission to the commercial printer. Although a commercial printer can provide very high quality customized materials, it usually takes several weeks to receive the final product and is very expensive.

With the advent of personal computers and the Internet, yet another option allows the consumer to visit a web-site and select a from a menu of products having text and drawing options to be printed on the product which are then ordered from the commercial printer from the convenience of a personal computer. As the designs are pre-prepared there is no need for a graphic artist. However, this option provides a limited number of choice selections and can also be expensive. Further, once the product is selected for printing it cannot be modified and it typically takes several weeks for the commercial printer to finish and send the final product.

Still another option is the purchase and installation of software products, such as PrintShop Deluxe, Microsoft Publisher, etc., which provide clipart graphics which can be imported into documents created by the user. Although these software applications allow the user to print locally on a desktop printer for producing immediate results and lower printing costs, the use of these software applications has several disadvantages. They either take up megabytes of valuable space on the personal computer's hard drive, or comprise several CD-ROMS which must be individually accessed to find and use the desired clipart graphic. Moreover, the software application is operating system-specific, (DOS, WINDOWS or MAC). Also, the quality of the graphics and layouts offered can be poor. Many average consumers find these applications difficult to learn and restrictive in use. Software updates require that new software be periodically purchased and downloaded.

Yet another option is to print documents and graphic designs directly from the Internet. The ever important influence of the Internet on individuals and businesses is evident from the following reports and statistics. According to a recent report, the number of Internet users in North America is approximately 92 million and it is estimated that 350 million people will be on the Internet by the year 2003. Over twelve million people visited the Blue Mountain Arts e-greeting web site during the month of December, 1999. It is estimated that e-commerce is expected to surge to more than one trillion dollars by the year 2003. Another report states that 21.9 million home personal computer users own a color printer and that an average of over 63 pages, the majority coming from the Internet, are printed each month by these users.

As more people take the time to shop and compare products on-line, they are finding that printing is one of the easiest ways to sort through the wide variety of information. Accordingly, companies conducting business on the Internet must create web sites which are visually appealing.

However, current on-line offerings relating to printing present obstacles. Currently, the contents and layout of a web page are typically limited to a screen resolution of only 72 dpi (dots per inch). Pre-formatted

documents are sent to the local printer resulting in low resolution prints which may have awkward page breaks within text or even images. No customization, printer capability, or page layout is made available.

Electronically accessed digital imagery may also be in a format which is incompatible with the software on the end user's personal computer so that the user cannot open or print the document. The resolution can vary greatly and may have been set at a level which is incompatible with the desktop printer. For example, the file may have been saved on a desktop scanner at 600 dpi or sent to a service bureau and scanned at a much higher resolution. Photographs taken with digital cameras are typically imported into a personal computer at approximately 1600 x 1200 dpi. High resolution images often occupy a great deal of electronic memory. Also, if the high resolution image appears in a one inch square graphic, enlarging the image will reduce its resolution. Furthermore, the user's printer may not have the capability of printing such a high-resolution image.

It would be advantageous for the personal computer user to be able to customize an electronic document or image for his or her personal needs. For example, the user may want to print an e-greeting card at high resolution and change the text font and orient the text or image to accommodate proper folding and presentation. It would also be advantageous for computer users' to share images in a common format which can be altered to meet the customization requirements and limitations of one user's printer or desires. However, such options are currently not available to Internet users.

Accordingly, there is a need for a process which improves and customizes documents and images taken from the Internet or other networks, for printing on the user's local printer. The present invention fulfills this need and provides other related advantages.

SUMMARY OF THE INVENTION

The present invention resides in a process which improves print quality and customizes documents and images created utilizing Internet-type

network applications. The process generally comprises the steps of first accessing, from a local computer, a web-site server having a pre-prepared selection of document layouts and content. A customized document request is created utilizing a plug-in component installed on the local computer and the customized document request is then communicated to the web-site server. Document layouts are retrieved from the web-site server according to the customized document request and a customized document fulfilling the request is sent from the web-site server to the local computer.

The plug-in can be downloaded by the user from the Internet or previously installed in the local computer's web browser. The web browser interfaces with the web-site server through the Internet and acts as a communication vehicle between the web-site server and the local computer.

The step of creating the customized document request includes selecting document type and content. Creation of the customized document request can also include selecting a graphics image, document resolution, and/or image and text orientation. In various document types, the user is allowed to add text to the document. The user may also apply a selected font to the text of the document.

After the customized document request has been created and fulfilled, the plug-in determines whether a printer connected to the local computer is capable of printing the customized document. If the printer is capable, the customized document can be printed. If the printer is not capable, the user is notified of the printer's incapability. The user can also electronically transfer the customized document to another personal computer. Thus, computer users can share images in a common format which can be altered to meet the customization requirements and limitations of one user's printer or desires to that of another.

Other features and advantages of the present invention will become apparent from the following more detailed description, taken in conjunction with the accompanying drawings which illustrate, by way of example, the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings illustrate the invention. In such drawings:

FIGURE 1 is schematic view of linked network system used in accordance with the present invention, having a local personal computer in electronic communication with a web-site server;

FIGURE 2A is flowchart illustrating the steps taken in designing a layout for a document to be created using the present invention;

FIGURE 2B is a flowchart illustrating the steps taken in deploying the requested layout to the web-site server for the creation of the customized document for later printing or electronic transfer;

FIGURE 3 is a flowchart illustrating the steps taken in accessing a web-site server and installing a plug-in on the local computer in accordance with the present invention;

FIGURE 4 is a flowchart illustrating the steps taken in selecting and designing a document in accordance with the present invention;

FIGURE 5 is a flowchart illustrating the steps taken in further modifying the document, including the addition of text, in accordance with the present invention;

FIGURE 6 is a flowchart illustrating the steps taken by the web-site server in retrieving data and files for the creation of the requested document;

FIGURE 7 is a flowchart illustrating the steps taken by the plug-in of the local computer after the web-site server sends the document to the local computer;

FIGURE 8 is a flowchart illustrating the steps taken at the local computer in preparing the document for printing;

FIGURE 9 is a flowchart illustrating the steps taken at the local computer once a print command has been received in determining whether the local computer's printer is capable of printing the document or not; and

FIGURE 10 is a flowchart illustrating the steps taken when the end user decides to electronically transfer the document to another local computer.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

As shown in the drawings for purposes of illustration, the present invention is concerned with a process for improving print quality of a document created utilizing Internet-type applications. With reference to FIG. 1, a linked network system, such as the world wide web, is shown wherein a local computer or system 10 (typically a personal computer) interfaces with a remote system 12 (typically a web-site server system) through a world web site or web page 14 of the Internet.

The Internet is a global computer network that provides the infrastructure for the world wide web. The world wide web is a communication system that is composed of millions of electronic files which contain links to other files stored on various connected computer networks. A computer network includes a group of computers or other such devices linked together in a manner that promotes communication between them. A computer network may include resources such as printers, modems and file servers. It may also include services such as electronic mail (e-mail) or file transfer. A computer network can be a small interconnected system (referred to as a local area network or LAN), or several separate networks that are connected together to form a larger network (wide area network or WAN). The Internet is comprised of many networks which form a large interfaceable network.

Referring to the exemplary Internet-based computer network of FIG. 1, the local computer 10 communicates with and accesses the server system or systems 12 via an Internet service provider connection such as a modem utilizing a phone line, cable line or other appropriate communications links. The server system 12 provides information to requesting computers on the network.

One of the most commonly used tools for communication over the Internet is a software application known as a browser. Examples of currently available browsers include Netscape Navigator and Microsoft Internet Explorer. A browser is a software application that runs on a local computer 10 and provides a user-friendly environment in which a user can interact with a server system 12 via a graphical user interface which allows the user of the local computer 10 to submit various requests or responses. A browser requests, transfers, and displays information that is stored as files on the Internet.

Requests submitted by the local computer 10 are processed by the server system 12 which responds to the request over the Internet by forwarding a request status and the requested information. One of the most commonly accessed resources on the Internet are web-sites or web pages 14. Web-sites 14 are interactive resources that provide an end user with a graphical interface for either viewing or downloading. A web-site may include a number of graphically displayable pages of information that are linked together, typically with hypertext or hyperlinks. The contents of a web-site can be created using a computer language such as Hypertext Markup Language (HTML) or Extensible Markup Language (XML) and the like. The document or page are text file coded with embedded predefined keywords or tags which are used by the server system 12 in locating information and responding to the local computer's request. Once the end user has viewed the web page, the user can interact with the web page by entering information in a dialog box or clicking on a button, for example.

In accordance with the present invention, predefined and pre-prepared document types and content catalogs or databases as well as applicable software applications and tags 16 are stored in conjunction with the web-site 14 at the server system 12. A software plug-in 18 is either acquired when the browser software is installed on the local computer, or downloaded in response to a query posed by a web-site utilizing the present invention as will be more fully described. In its most general sense, the plug-in 18 is used as a tool to select document types and alter document content

and qualities of documents offered on web-sites 14 incorporating the present invention according to the embedded tags and available documents and content. These customized document requests can be sent from the server 12 to the local computer 10 for customized and enhanced prints 20. Alternatively, the customized document can be electronically transferred to another personal computer 10.

FIGS. 2A and 2B provide an overview of the process of the present invention. Referring to FIG. 2A, the creator or owner of the web-site determines what type of layout selections will be offered through the web-site (100). The selections chosen by the web-site owner determines the content displayed in the browser window (102). The local personal computer system 10 interfaces with the web-site (104) and the Internet web-site pages are displayed on the local computer (106). The end user can then create a layout specification or request (108).

Referring to FIG. 2B, after the browser of the personal computer 10 communicates with the web-site server 12 via the Internet as described above (110), a web page is displayed (112). The end user selects content from the catalog collection or data base of document file selections offered through the web-site server 12 and customizes the content (114) of the documents as desired, being limited only by pre-set document type and content parameters. Typically the inventive process will walk the user through this process with several windows of selection options. For example, the end user may select a document in the form of a greeting card and then select from a list of available graphics, previously created text, or be given the option of adding his or her own text to the greeting card. Due to the space constraints of the greeting card, the added text may be limited to a predetermined number of characters.

The local computer user then decides whether to electronically transfer or print the requested document (116). If the user decides to e-mail the customized document, the user inputs the recipient's e-mail address (118). Local and server resources are accessed (120) and the plug-in collects the necessary resources for e-mail output (122) before sending the

e-mail to the recipient (124). The recipient has several options upon receiving the document as will be described more fully below. If, on the other hand, the user decides to print the customized document, the user initiates a print request (126). The plug-in accesses local resources (128), formats the file for printed output (130) and prints a high resolution customized document on the local printer (132).

FIGS. 3 through 10 provide the more specific and particular steps taken during the process of the present invention. Referring to FIG. 3, the local computer end user accesses an Internet site (200) having a web-site 14 which incorporates the present invention. A query is made as to whether the user has the necessary plug-in 18 registered on the users personal computer 10 to utilize the present invention (202). If the web browser of the local computer 10 was installed with the plug-in 18 or if the plug-in 18 was already downloaded from the Internet (204) the process continues (206). If the local computer does not (208), HTML script redirects the end user to a file transfer protocol (ftp) plug-in repository (210). There the user agrees to download and install the plug-in from the Internet (212 and 214) in order to continue (206). If the user does not agree to download and install the plug-in (212 and 214), the user is exited from the process (218).

With reference to FIG. 4, once the plug-in has been installed, the user begins the design decision process (300) by selecting a document type (302). There is no limit on the types of documents that can be offered. Examples include greeting cards, business cards, clip-art, stationary, brochures, client product graphics and text, etc. The end user then selects the content of the document (302). The content is evaluated for suitability of the document type (304). For example, a business card document type will only allow limited sizes and types of graphics and text in comparison to brochure documents. If the content and document type are suitable for one another (306 and 308), a database search is initiated and the appropriate files based on the end user selection and choices are retrieved (310). The document and content are returned from the server web-site 14 to the plug-in

18 for display on the local computer 10 (312) and the process returns to the logic loop (314).

If the document and content are not suitable (316), the inventive process determines whether the content can be modified to meet the requirements of the document type (318). If the content can be modified (320), the database search is initiated based on the modifications, and the appropriate choices or files based on the end user selection are retrieved (310). The document and content are then returned from the server web-site 14 to the plug-in 18 for display on the local computer 10 (312) and the process returns to the logic loop (314). If the content can not be modified (322), an error message is sent to the local computer 10 through the browser (324).

Referring now to FIG. 5, as part of the dynamic creation of a document type from a browser web page (400), the inventive process determines whether the selections of the end user allow content input from the user in text form (402). For example, a greeting card may allow the user to add his or her own message or prose. If the content does not (404 and 406), the process returns to the logic loop (408). However, if the selection does allow text input (404 and 410), text entry areas are created (412) to allow the user to enter in his or her own text. The inventive process then queries whether the fonts are to be changed (414). For example, the default text may be Times Roman, but the user may desire Arial or another text font or even font size. If the user changes the fonts (414), the selected fonts are applied to the text and the text areas are made known to the print plug-in 18 (420). If the font is not changed (422), the text areas and entries are made known to the print plug-in (420) without alteration. The end user then decides whether to collect and print the requested document or electronically transfer the document to another local computer 10 (424). The end user initiates a special print command from within the browser to print (426) or initiates a special e-mail command from within the browser (428) depending on the user decision.

With reference to FIG. 6, after the selections of document type and content are made, the plug-in 18 communicates the end user request selections and data to the server system 12 (500). Upon receipt of the request, the application component of the invention 16 on the server system 12 accesses the content files (502). The application component 16 then evaluates the end user content data request (504). As with traditional browser requests where the requested information is retrieved by the server piecemeal until the loop is completed and all of the information requested is sent, the server 12 finds the document selection and content files and data and sends these to the browser and plug-in 18 in a loop until the request is fulfilled (506). The application component 16 of the server 12 formats the file according to the end user content data request (508).

Referring to FIG. 7, if the end user decides to collect the document on his or her local computer 10 for printing, the server 12 downloads the file to the end user's local personal computer 10 (600). The plug-in 18 of the local computer 10 then evaluates the end user's content data which was received from the server 12 (602) to ensure that all of the data has been collected. The plug-in 18 then prepares the print page layout based on the content data collected (604).

Referring now to FIG. 8, the user chooses to print (700) and the content is collected by the plug-in 18 for printing (702). The content is created to be compatible with the print device attached to the local computer 10 (704). Resolution is applied (706) and the content is arranged to fit the document type selected (708). The plug-in 18 then determines whether the content as prepared for printing is suitable for the document type (710). If it is not (712), an error message is returned to the browser for display (714). However, if the content is suitable (716), the content is returned to the plug-in 18 for printing (718) and the process returned to the loop logic (720).

With reference to FIG. 9, after the plug-in 18 has received the print content (800), the local printer is evaluated for suitability (802). For example, the document may have colored portions or require certain resolutions which the printer cannot perform. If the printer is not suitable (804 and 806), an

error message is returned to the local computer user (808) and the process stops (810). On the other hand, if the printer is found to be suitable (804 and 812), the paper is measured (814) and the print content is positioned based on document type (816). For example, with a greeting card, the text to be printed must be properly oriented, perhaps on the reverse side of the paper sheet for later feeding, with respect to the front cover graphic. Likewise, for a business card some of the text will be centered while other text or graphics may be positioned in a corner of the card. There may also be several cards per sheet of paper depending on the document type and content. The plug-in 18 also determines whether a text box was made available for the end user to enter in his or her own text (818). If it was (820), that text content is positioned based on the document type and font information provided (822) before submitting the print job from the browser plug-in 18 to the local printer (824). If there was not a text box available for the document selection or the end user did not add to the text box (826), the print job is immediately submitted (824) before returning to the program logic (828).

As stated above, the end user also has the option of electronically transferring the customized document via e-mail of the like. Referring to FIG. 10, the user first makes the decision to e-mail the document (900) and then inputs the recipient's e-mail address and any additional text message which is to accompany the e-mail before sending the message and document (902). The plug-in 18 collects the document information and uploads the data to the application component 16 on the server system 12 (904). The document is prepared, usually as an HTML e-mail document, including the necessary link, such as a hyperlink, back to the originating web-site 14 for replication of the original document (906). The web server system 12 then sends the prepared HTML e-mail to the recipient (908).

Upon retrieving the e-mail, the recipient will view an online document suitable for viewing in an HTML enabled e-mail client local system or web browser (910). The recipient may elect to click the link back to the web-site 14 of the server system 12 where the server will rebuild the document

according to the needs or desires of the recipient, or click an embedded print button to print the document on his or her local printer (912).

Granting the option of rebuilding the document is advantageous as the recipient may not have the same level of printing capabilities as that selected by the sender and thus may want to rebuild the document according to his or her system capabilities. Also, the recipient may elect to modify the document according to his or her desires and then print or even send the modified document back to the recipient. Such options are helpful in certain situations where a project is being worked on by more than one individual at the same company or a document preparation company is preparing documents for a client, such as brochures or the like.

Utilizing the present invention overcomes the problems of purchasing costly software which must be downloaded and periodically updated as well as the severe limitations of printing from the world wide web. Whereas customization of documents is virtually non-existent on the world wide web and print resolution poor, the present invention allows users to easily print high-resolution, high quality images and make font, format, orientation and other stylistic changes to the document they wish to print.

The above-described inventive process can be applied to a number of items including, but not limited to, greeting cards, flyers, letterhead, brochures, labels, certificates, product information and artwork which can be produced and printed from the convenience of a personal computer connected to the Internet. Furthermore, there is no need to travel to a store or wait for a software application to arrive. Due to the fact that the application is available on-line, updates are immediately available.

The present invention also provides advantages to those advertising products and information on the Internet as the end user can select product and information graphics and text which appeals to the end user and print the document for later reference. For example, a car dealership can offer the service of allowing the potential consumer to select a car type, color, and accessories for assembly and printing so that the potential consumer can view his combined selection. Details such as warranties, performance,

rebates, and dealership information can also be provided as accompanying text which will increase the likelihood that the consumer will purchase a car from that particular dealer.

Although the inventive process has been described in detail for purposes of illustration, various modifications may be made without departing from the spirit and scope of the invention. Accordingly, the invention is not to be limited, except as by the appended claims.